

## **Non Neoplastic Lesions of the Nasal Cavity and Paranasal Sinuses-A Histopathological Study**

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**Abstract:** Nose is one the very prominent and striking part of the face both for its functional and aesthetic significance. Any lesion in that part is very disturbing to the patient and also poses a diagnostic challenge to the clinician due to its closed architecture. Benign lesions of this area are a real challenge to the pathologist. The spectrum of lesions varies remarkably in southern regions of india given the increased humidity and long monsoon. Our study aimed to analyze the histopathological spectrum of various non-malignant lesions of nasal cavity and para-nasal sinuses with reference to sex and age differences. The study was conducted at a tertiary care otorhinolaryngology center, Government ENT hospital, Hyderabad, Telangana over a period of two years (June 2015 to May 2017). We studied 449 sinonasal lesions over a period of two years and 287 were diagnosed as non-neoplastic. The most common lesion was a sinonasal polyp. We noticed that the lesions were common in males of the 3<sup>rd</sup> and 4<sup>th</sup> decade. Sinonasal masses pose a variety of diagnostic challenge, especially the non-neoplastic lesions which actually outnumber the neoplastic lesions; hence knowledge of all possible lesions in this region enables a pathologist to give an accurate diagnosis .

**Keywords:** Sinonasal masses, rhinoscleroma, rhinosporidiosis, sinonasal hamaratomata, sinonasal heterotopias, rhinophyma.

### **INTRODUCTION**

The nasal cavity and paranasal sinuses are collectively referred as sinonasal tract. Sinonasal area is exposed to various infective agents, chemicals, antigens, mechanical and many other influences. These deleterious exposures lead to formation of tumour like and neoplastic conditions [1]. Sino nasal and nasopharyngeal masses are common findings in ENT outpatient department. The incidence being 1-4% of population [2]. A variety of non-neoplastic and neoplastic conditions involve the nasal cavity and paranasal sinuses which are commonly encountered in clinical practice [3]. It is quite impossible to distinguish clinically between simple nasal polyps, polypoidal lesions which are caused by specific granulomatous diseases and polypoidal neoplasms; hence it becomes important that all polyps and polypoidal lesions of nose should be submitted for histopathological examination [4-6]. The majority of sinonasal lesions are

inflammatory with neoplasms comprising approximately 3% of all head and neck tumours [7].

The present study was undertaken to analyse and correlate various non malignant lesions occurring in the nasal cavity, paranasal sinuses and nasopharynx, especially in the southern part of India.

### **MATERIALS AND METHODS**

Our study was conducted at a tertiary care centre in Government ENT hospital, Hyderabad, Telanagana. It is an exclusive centre for the diseases of ear, nose and throat getting referrals from many of the south Indian states. The study extended over a period of two years –June 2015 to May 2017.

We studied the nonneoplastic lesions of nasal, sinonasal and paranasal regions. Relevant clinical details and presentation were analyzed.

We received 449 sinonasal lesional biopsies accounting for about 10% of all ENT biopsies. Cases with nonspecific inflammation and malignant lesions were excluded. Those with nondiagnostic material were also excluded.

**RESULTS**

The study which extended over a period of two years included a total of 449 cases of which 287(63.9%) cases were nonneoplastic lesions and 162(36.1%) cases

were neoplastic lesions. The non-neoplastic lesions strikingly outnumbered the neoplastic lesions.

Our study included patients from 7 years to 80 years .More than half of cases were noted in the second and third decade (56.4%)(Table 1).

There was a male preponderance, with the male to female ratio of 1.8: 1. (Table 2)

**Table-1: Age wise distribution of cases**

| Age in years | Total no of cases |
|--------------|-------------------|
| 0-10         | 3(0.95%)          |
| 11-20        | 31(10.7%)         |
| 21-30        | 85(29.5%)         |
| 31-40        | 77(26.9%)         |
| 41-50        | 46(16.1%)         |
| 51-60        | 28(9.7%)          |
| 61-70        | 14(5%)            |
| 71-80        | 3(1.1%)           |

**Table-2: Sex wise distribution of various lesions**

|                  |         |
|------------------|---------|
| Toal no of cases | 287     |
| Male             | 185     |
| Female           | 102     |
| M:f ratio        | 1.8 : 1 |

Routine histopathological examination was done and wherever necessary special stains were done to demonstrate and confirm fungi or crystals. Histopathological examination revealed that out of 449

cases clinically diagnosed as polypoid lesion, there were 287 cases (63.9%) of benign nonneoplastic lesions and 162 cases (36.1%) of neoplastic.

**Table-3: Incidence of various lesions**

| S.no | HPE diagnosis                                    | No. of cases(n) | Percentage (%) |
|------|--|-----------------|----------------|
| 1    | Sinonasal polyp                                  | 227             | 79.1 %         |
| 2    | Allergic fungal sinusitis                        | 30              | 10.45 %        |
| 3    | Rhinosporidiosis                                 | 10              | 3.48 %         |
| 4    | Invasive fungal sinusitis                        | 8               | 2.78 %         |
| 5    | Fungal ball                                      | 4               | 1.39 %         |
| 6    | Nasolabial cyst                                  | 3               | 1.04 %         |
| 7    | Rhinophyma                                       | 1               | 0.34%          |
| 8    | Fibrous dysplasia                                | 1               | 0.34%          |
| 9    | Rhinoscleroma                                    | 1               | 0.34%          |
| 10   | Neuroglial heterotopias                          | 1               | 0.34%          |
| 11   | Respiratory Epithelial Adenomatous Hamartoma     | 1               | 0.34%          |
| 12   | Chondro Osseous Respiratory Epithelial hamartoma | 1               | 0.34%          |

Analysis showed that the sinonasal inflammatory polyp (Fig 1) was the most common of all the nonneoplastic lesions 227(79.1%). They were more common in males than in females. The male to female ratio was 1.8:1. On microscopy the polyps were

composed of loose mucoid stroma and mucous glands, covered by respiratory epithelium. The stroma showed inflammatory infiltrate composed of lymphocytes, plasma cells, neutrophils and eosinophils.

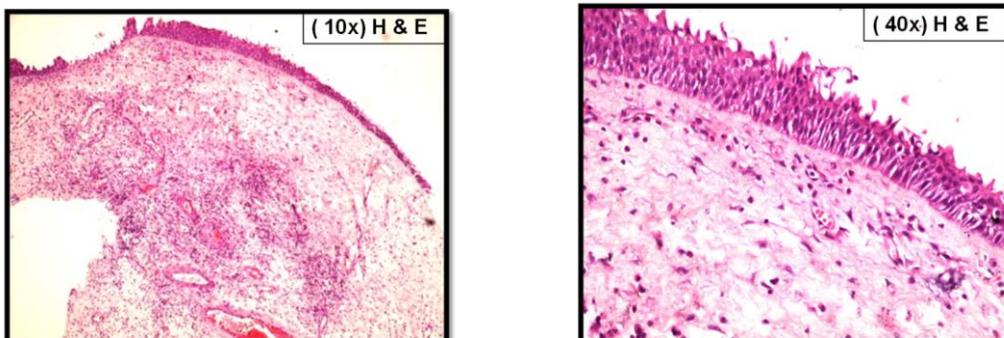


Fig 1-sinonasal polyp- hematoxylin and eosin

Fig-1: Sino nasal polyp- hematoxylin and eosin stain showing loose myxoid stroma with inflammatory infiltrate

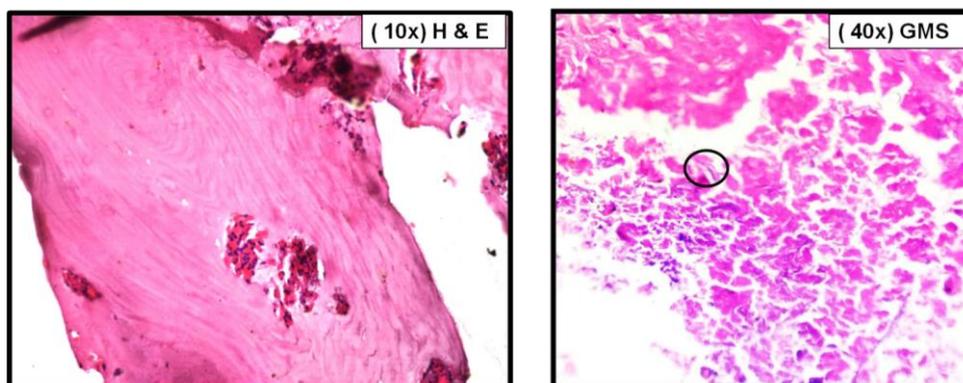


Fig 2-allergic fungal sinusitis

Fig-2: Allergic fungal sinusitis

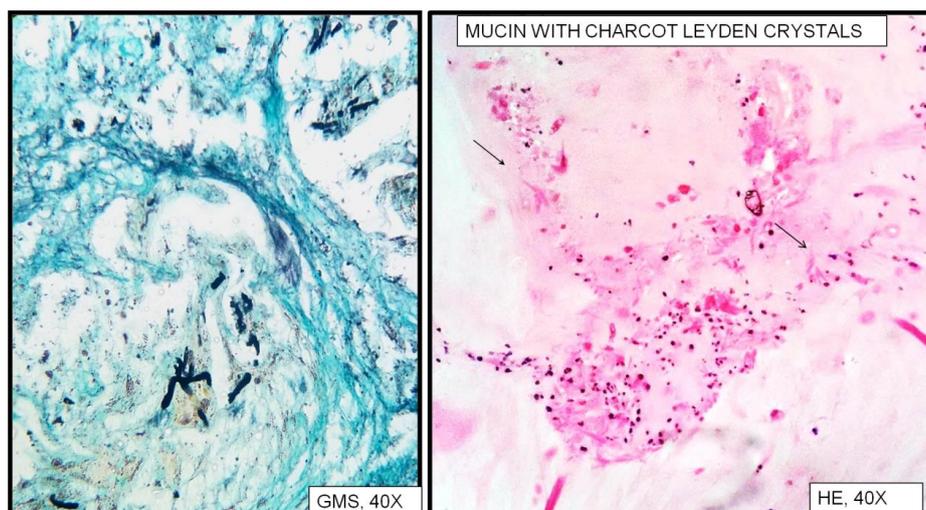
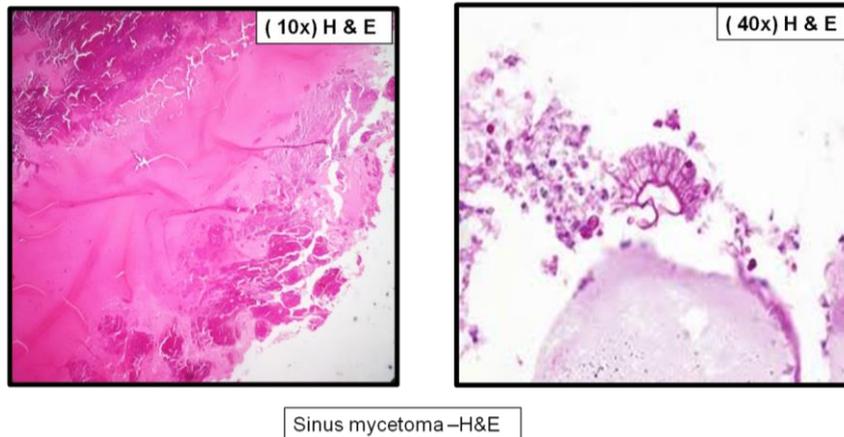
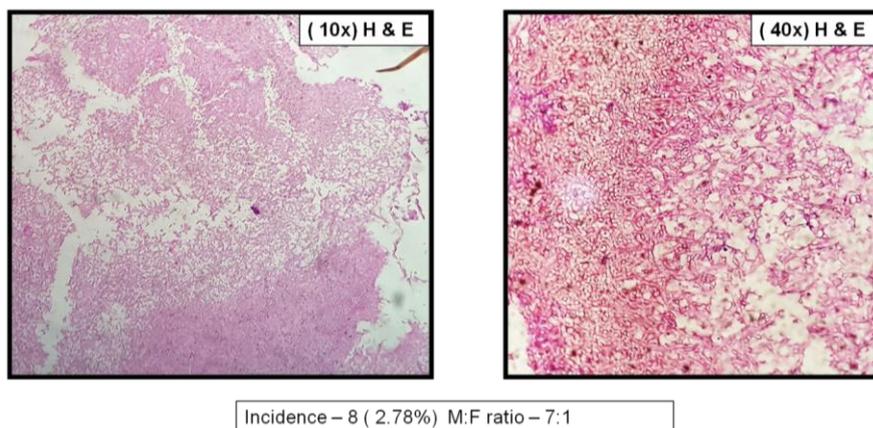


Fig-3: GMS demonstrating the fungi



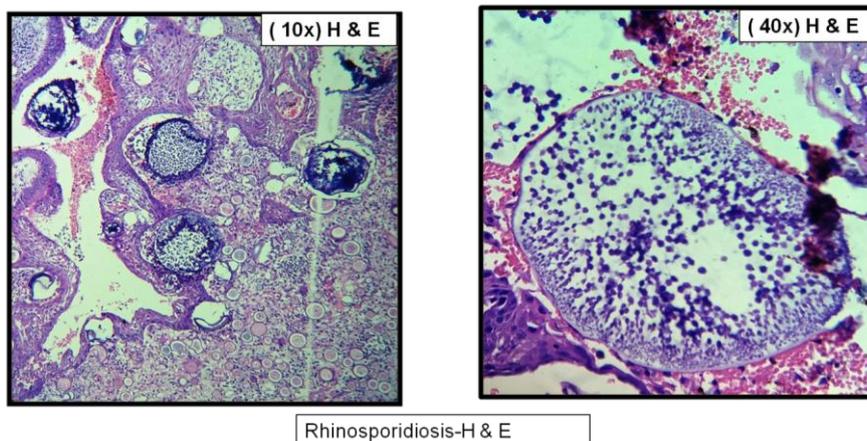
**Fig-4: a case of fungal sinusitis-with mycetoma**



**Fig-5: Invasive fungal sinusitis**

Fungal lesions of the sinonasal tract accounted for about 15% of cases of which there were 30(10.45%) cases of allergic fungal sinusitis(fig 2). There were 30 cases of allergic fungal sinusitis (fig 3) with male to female ratio of incidence being 1: 1.5. There were also

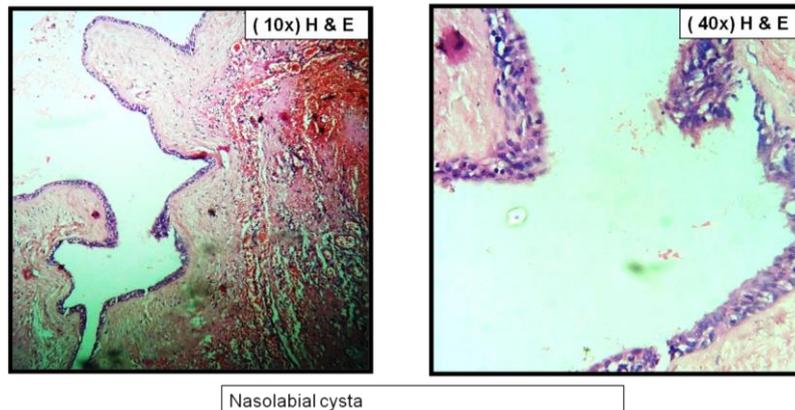
8 cases of invasive fungal sinusitis (Fig5) .The invasive fungal sinusitis were predominantly seen in men (7; 1). For fungal sinusitis and mycetoma demonstration special stains like Gommoris Methanamine stain were used (Fig3 & 4).



**Fig-6: Rhinosporidiosis-H & E showing multiple sporangia containing numerous spores**

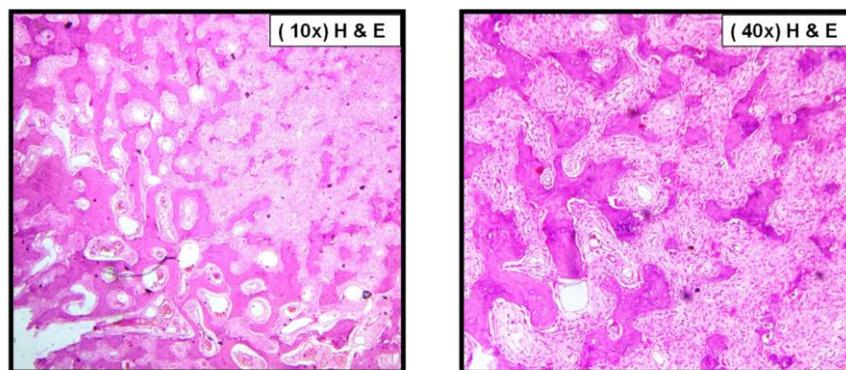
Rhinosporidiosis is an endemic in Asia and a few African countries. We found 10(3.48%) cases of rhinosporidiosis(Fig 6) in our study with marked

predeliction to males(9;1). Microscopically, there are numerous diagnostic globular cysts representing thick walled sporangium containing numerous spores.



Nasolabial cysta

**Fig-7: Nasolabial cyst-H & E showing a multilayered /pseudostratified epithelium with loose stroma**  
Nasolabial cysts (Fig 7) were noted in three cases and incidentally all cases were seen in female patients, which accounted for 1.04% of cases. The nasolabial cyst is a rare non-odontogenic cyst that develops within the skin adjacent to the ala of nose around the uppermost portion of the nasolabial crease;

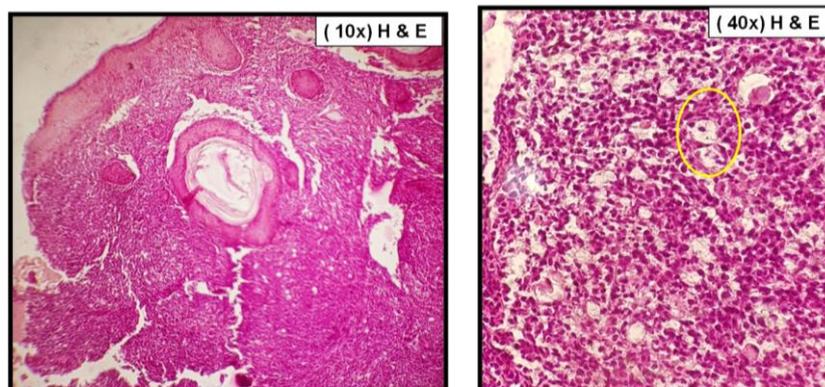


Fibrous dysplasia

**Fig-8: Fibrous dysplasia-H&E showing classical Chinese letter pattern of woven bone in hypocellular stroma**

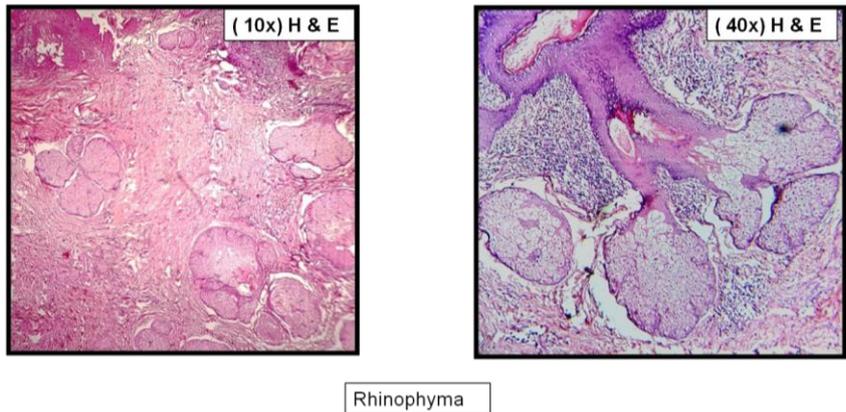
Also one case of fibrous dysplasia (Fig 8) was noted in a 28 years old. Female. Histopathological

examination showed curvilinear bony trabeculae in hypocellular fibroblastic stroma



Rhinoscleroma

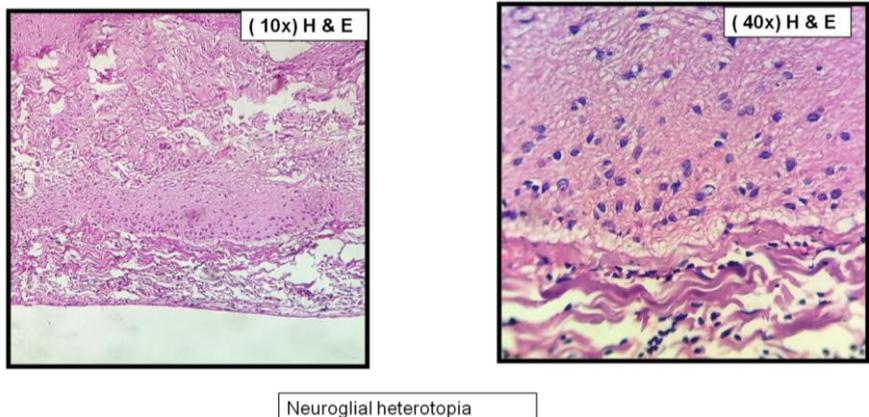
**Fig-9: Rhinoscleroma-H&E- showing mikulicz cells (yellow circle)-foamy histiocytes and plasma cells.**  
Rhinoscleroma(Fig 9) was encountered in a 21 years old male in our study. Characteristic foamy histiocytes- the mikulicz cells were noted along with plasma cells. At times Vasculitis, ulceration and pseudoepitheliomatous hyperplasia may also be present



**Fig-10: Rhinophyma-H&E showing interstitial hyperplasia,with enlarged blood-vessels and lymphatics and marked dilatation and increase of the sebaceous glands**

Rhinophyma (Fig 10) was seen in a 56 year old male. Rhinophyma is a benign skin deformity characterized by tumorous growth leading to a large,

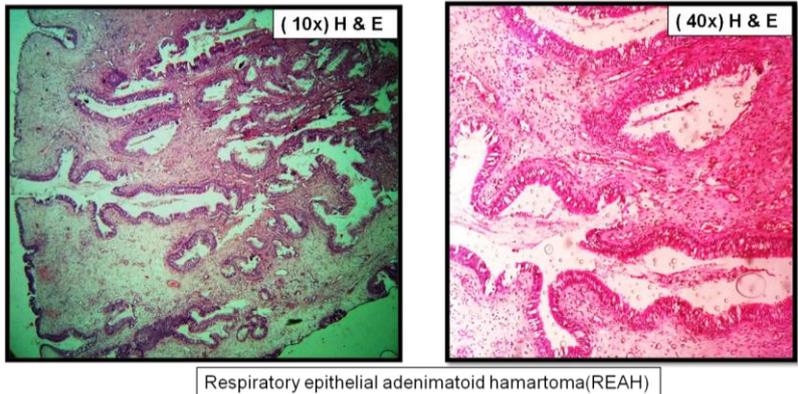
bulbous, and erythematous appearing nose. It is considered to be one characteristic of advanced stage IV rosacea.



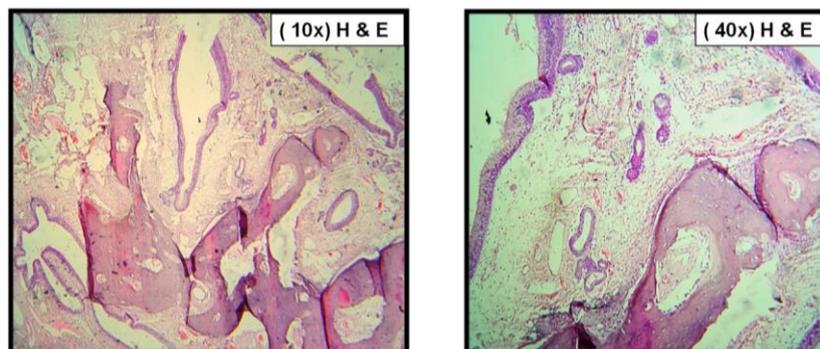
**Fig-11: Neuroglial heterotopias-H&E showing astrocytic neuroglial tissue, interlacing with fibrous and vascular connective tissue, which is lined by respiratory mucosa.**

Neuroglial heterotopias (Fig 11) are a congenital malformation of displaced, mature glial tissue in which continuity with the intracranial

meningeal component has become obliterated<sup>9</sup>. We found one case of neuroglial heterotopias in a young 8year old girl.



**Fig-12: REAH-Respiratory epithelial adenomatoid hamartoma-H&E showing multiple proliferating glandular spaces lined by ciliated epithelium with few goblet cells showing a thick eosinophilic basement membrane**



**CHONDROOSSEOUS & RESPIRATORY EPITHELIAL HAMARTOMA**

**Fig-13-COREAH- H&E showing both mesenchymal and epuithelial components-cartilage and glands**

Also one case each of chondrosseous respiratory epithelial hamartoma (Fig13) and Respiratory Epithelial Adenomatous Hamartoma (Fig 12) were found in 12 year old girl and a 56year old man. Respiratory epithelial adenomatoid hamartoma (REAH) and chondro-osseous respiratory epithelial adenomatoid hamartoma (COREAH) are examples of hamartomas comprising both epithelial and mesenchymal components [9].

**DISCUSSION**

Lesions of nasal and paranasal region form a heterogenous group which is mostly diagnosed as a nasal polyp [5]. It is essential to have a

histopathological analysis in order to ascertain a definitive diagnosis.

In the present study incidence of sinonasal lesions was 224 cases per year, accounting for approximately 10% of surgical pathology material received in ENT hospital. In a study conducted by Aparna *et al.* [1] the sinonasal lesions accounted for only 1.5% of the surgical pathology load. The high percentage of cases in our study could be because our institute is an exclusive otorhinolaryngology speciality tertiary care institute. Among them the non-neoplastic lesions were 143 per year, almost more than or equal to the malignant lesions.

**Table-4: Peak age incidence and m:f ratio of various lesion according in present study and other studies**

| LESIONS  | Aparna et al | Das Gupta et al | Zafar et al | Present study |
|--|--------------|-----------------|-------------|---------------|
| Sinonasal polyp                                  | 32.6 1.39:1  | 31.4 2.4:1      | 29 2:1      | 33, 1.8:1     |
| Fungal Infection                                 | 20.5 1:0     | 33 1:0          | 36 1.5:1    | 33.4, 1.1:1   |
| Rhinosporidiosis                                 | 32.9 3.5:1   | 34 3.6:1        | --          | 33.6, 9:1     |
| Nasolabial cyst                                  | --           | --              | --          | 62.5 ,0:1     |
| Rhinoscleroma                                    | 55.5 1:0     | 35 1:1          | 36 1.3:1    | 36, 1:0       |
| Fibrous dysplasia                                | --           | --              | 5 1:1       | 7, 0:1        |
| Chondro osseous respiratory epithelial Hamartoma | --           | --              | --          | 15 ,0:1       |
| Respiratory epithelial adenomatoid Hamartoma     | --           | --              | --          | 8, 0:1        |
| Rhinophyma                                       | --           | --              | --          | 56, 1:0       |
| Neuroglial Heterotopia                           | --           | --              | --          | 8, 0:1        |

The sinonasal lesions had a predilection to men with the male to female ratiobeing 1.8:1, similar to the studies conducted by Aparna *et al.* [1], Zafar *et al.* [2] and Das gupta *et al.* [5]

Most of the cases were seen during the 3<sup>rd</sup> and 4<sup>th</sup> decade (Table 4). Study by Aparna *et al.* [1] had similar observation. Zafar *et al.* [2] and Bakari *et al.* [4] reported the mean age of presentation as 22.5 and 33 years.

Sinonasal polyps formed the main proportion of the study accounting for 79% of all cases similar to

the studies by Bakari *et al.* [4], Tondon *et al.* [8] (Table 5).

Rhinosporidiosis was noted in 10 cases whereas other fungal infections accounted for 42 more cases. This was slightly different from studies done by other authors. This could be because of different geographical incidence of rhinosporidiosis. However there was marked incidence of fungal infections in our study.

Also we encountered a variety of rare cases like respiratory epithelial adenomatoid hamartoma, neuroglial heterotopias, rhinophyma, rhinosclerosis and Chondro osseous respiratory epithelial hamartoma.

Table-5: incidence of various lesions- a comparative study

| Sl. No | LESION   | Aparna <i>et al.</i> | Das Gupta <i>et al.</i> | Zafar <i>et al.</i> | Present study |
|--------|--|----------------------|-------------------------|---------------------|---------------|
| 1.     | Sinonasal polyp                                  | 70 (69.3)            | 110(62.85)              | 119(82)             | 227(79.1)     |
| 2.     | Fungal Infection                                 | 1 (0.99)             | 1 (0.5)                 | 5(3.45)             | 42(14.63)     |
| 3.     | Rhinosporidiosis                                 | 14 (13.86)           | 55 (31.4)               | ---                 | 10(3.48)      |
| 4.     | Nasolabial cyst                                  | ---                  | ---                     | ---                 | 3(1.04)       |
| 5.     | Rhinoscleroma                                    | 16 (15.8)            | 2 (1.2)                 | 7(4.83)             | 1(0.34)       |
| 6.     | Fibrous dysplasia                                | ---                  | ---                     | 2(1.37)             | 1(0.34)       |
| 7.     | Chondro osseous respiratory epithelial Hamartoma | ---                  | ---                     | ---                 | 1(0.34)       |
| 8.     | Respiratory epithelial adenomatoid Hamartoma     | ---                  | ---                     | ---                 | 1(0.34)       |
| 9.     | Rhinophyma                                       | ---                  | ---                     | ---                 | 1(0.34)       |
| 10.    | Neuroglial Heterotopia                           | ---                  | ---                     | ---                 | 1(0.34)       |

## CONCLUSION

Masses in the nasal and paranasal region are increasingly in the present days of immense pollution, allergies and increasing autoimmune disorders. It is increasingly important to identify the lesions of this region accurately, especially the benign lesions by histopathology in order to administer correct treatment. The present study analyses the spectrum of various benign lesions of the sinonasal masses

It is very essential to have knowledge of the various non neoplastic lesions of the sinonasal region in order to differentiate from the neoplastic lesions as the management varies considerably.

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